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ABSTRACT

A survey conducted by the National Cable Television Association found that cable television (CTV) is not now being utilized for "hard" instruction to help solve some of the current problems in higher education. Since CTV is being merely used as an extension of what exists, it has become an added cost rather than a method of reducing costs. Consequently many educators are calling for action now while CTV is just in the development stages--programs must be developed and empirically tested, and in some cases the FCC must act to support educational provisions. All these require time and the leadership of educators. (SK)

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THE IMPLICATIONS OF CABLE TELEVISION ON HIGHER EDUCATION

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The Implications of Cable Television on Higher Education

Cable television (CTV) has been identified as a communication system capable of altering the basic economic and social structures of this country. Its possible dissemination has resulted in many prognostications of possible services and disservices. At the same time, the total impact of problems, trends, and goals of universities and colleges has dictated that some changes in educational philosophies and instructional strategies may be necessary if these institutions are to meet current and future student needs. Based on early prognostications, the use of cable television to implement these changes seems to be the only logical solution. Unfortunately, very little information is currently available to assist educators in making these decisions. To date, most of the articles appearing in professional journals have been concerned with describing existing systems.[1] Therefore, this paper will be concerned with providing some of the necessary information to assist educators in deciding whether to adopt CTV at their institutions. Areas to be considered are: (1) describing the problems, trends and goals of the institutions of higher education, (2) defining cable television, (3) discussing existing and possible applications of cable television to the university setting, (4) showing how CTV can solve the problems in education, and (5) presenting a preliminary plan for obtaining a CTV distribution system.

Education and the Resistance to Change

Trends and Problems

Much has been written concerning the current problems in higher education.

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Basically, these problems involve increasing enrollments with concurrently decreasing resources.[2] Diminishing resources has resulted in smaller faculties with lower budgets. The consequent has typically been that many instructors are spending more time in mass enrollment courses with little time left for specialized interests and research.[3] A third problem has been to measure the quality of education in terms of resources used rather than focusing on the amount of learning. The result has been the application of resources without regard for efficiency,[4] thus wasting this diminishing comodity

Further compounding these problems is the change in emphasis by administrators from mass learning to individualized instruction. Consequently, a fourth problem has arisen: how to teach individuals in a mass educational system? Related to the problems involved in adapting to current educational system to one of individualized instruction is the changing advocacy of evaluating students on time standards to one of performance criteria. A change to task orientation will render college degrees as indicating performance levels rather than time in school. Some universities have successfully retooled their programs to reflect these changes of emphasis, e.g., Baldwin Whitehall School at the University of Pittsburgh.[5]

Besides the problems and trends in education, the goals of a university must still be kept in perspective. These goals are: (1) education and research, (2) public service, and (3) solution of community problems.[6] These goals must be satisfied if government support is to continue.

Obviously, when all the problems, trends, and goals are considered, <u>in toto</u>, the only possible conclusion that can be safely drawn is that the entire educational community must undergo a transformation to meet increasing student needs and still cope with the problem of decreasing resources. Probably the only available method of solving these problems is to adopt a various mixture of telecommunication technological innovations to expand instructor capabilities to reach more students

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at less expense. Currently a few institutions, the early adopters, have recognized this solution as a means to meet student needs.[7] A careful selection of media can function to transmit necessary information to students at their pace and still release the instructor to: (1) spend more time in specialized areas, (2) conduct research, or (3) develop more courses at a lower cost per student than possible utilizing traditional instructional strategies. Also, the proper selection of media will allow the student to receive information via a desired channel of communication rather than just the instructor.[8]

Unfortunately, wholesale changes in educational institutions have typically been very slow or nonexistent. Many explanations have been posited for this resistance to change. These explanations have centered around fear of job security and unfamiliarity with the proposed technological advances.

Resistance to Change

One of the earliest technological innovations available to educators was television. Utilized first at Iowa in the 1950's, televised instruction has grown much more rapidly in the public schools than in the universities. One of the major reasons for the failure to adopt televised instructional strategies was faculty and administration resistance to change. Even when television was introduced into the classroom, the traditional lecture approach was imposed on a much more versatile medium. Consequently, little experimenting was accomplished with software[9] and both faculty and student acceptance of the medium was minimal

Two standard explanations can be posited for this resistance to television: (1) resentment and fear: and, (2) failure and inability to recognize the potential of the innovation. The first group of educators offers the most resistance to change. The failure to deal with the attitudes of these people has severly limited the use of television. The ability to persuade educators to change is just as important as the availability of the hardware.[10] The second group of educators are a result of administrators failing to show any interest in innovative

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teaching techniques[11] and the lack of in-service training of teachers in the available media.[12] The result of this lack of training has been the failure of educators to recognize possible applications of technology before it has been tested and fully developed. Consequently, they have not had any formal input into the formative stages and technology with fantastic educational potential have become mere appendages.[13]

The typical response to diminishing resources by faculties and administrators resisting change has been to reduce operating costs. Carpenter states that under these conditions television (and any other technological innovation) can only make a minimal contribution to education.[14] To change this trend, educators must be devoted to solving the problems in education. Operating costs can only be reduced so far, then alternative solutions must be explored. One such alternative might be the adoption of cable television (CTV). Since CTV is just developing in the area of education, educators should begin to recognize possible uses in the classroom and the necessary changes in behavior which must accompany these uses. For, if CTV is to be just an additional resource available to the classroom instructor, it too will only make a minimal contribution.[15]

What is Cable Television?

Cable television, the wiring of television receivers to a central antenna, has typically been and currently is used to improve the reception of distant or local signals in areas of signal inferiority or signal starved markets. Recently, CTV has undergone a dramatic growth. One result of this growth has been the promulgation of regulations (to be discussed in the following section) by the Federal Communications Commission which, in turn, has produced some interest in the use of CTV to provide certain services to the public.[16] One such service applies to higher education and offers a fourth distribution alternative to the existing systems of: (1) instructional television (formerly educational television),

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(2) instructional television fixed service (ITFS). and (3) closed circuit television (CCTV).

ITV, ITFS, CCTV, and CTV Distribution Systems

Physically, CTV is identical to a CCTV system. Both systems are wired and can be closed to outside reception Differences are found in program sources and control. In CTV, programs originate from a headend where they are amplified, filtered, and pushed down the wires to the television receivers These programs are controlled by various independent users. CCTV differs in that no antennas are typically used and a small group of administrators control program scheduling and production.[17] Conversely, ITFS systems involve the acutal over-the-air broadcasting to a parabolic dish receiver on special frequencies with a capacity of four channels [18] An instructional television station also broadcasts programs over-the-air, but uses only one channel which can be received on a normal television. Both systems must be licensed by the FCC.

All four distribution systems have obvious advantages and disadvantages. The instruction or public television station allows the dissemination of information to many classrooms and the surrounding community. However, this system is very expensive, inflexible, and does not permit a closed system nor student-teacher interaction. The ITFS system increases the number of frequencies available over instructional television, permits closed viewing, allows student-teacher interaction and has a larger coverage area than either CTV or CCTV. The disadvantages are inflexibility (four channel maximum), the need for special receivers, relatively high cost, necessity for FCC license, and inability to reach the community. A closed circuit system (CCTV) is much more flexible and can offer all the advantages of ITV and ITFS systems The primary disadvantage is the initial capital outlay which must be provided by the university. The primary advantage of CTV is the possible availability of many channels controlled by

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users, the programs would be available to the community, and the initial cost of equipment could be absorbed in part by the subscribers. The primary disadvantage is the limited coverage (five miles) of one system. However, the addition of a stationery satellite or microwave unit could be used to interconnect universities. Each distribution system is more suited to specific situations: (1) ITFS is a logical choice when a large region must be covered with few channels, (2) CCTV is ideal when only one building or series of buildings can be connected; and (3) CTV should be preferred when multiple connections in various locations are desired.[19]

A discussion of cable television would not be complete without a brief synopsis of the federal regulations governing educational provisions.

FCC Regulations

The impact of the inability of educators to apply technological innovations, namely television and ITFS, is no more evident than in the current FCC provisions for educational uses of cable television. Basically, the FCC has adopted a wait and see attitude. The Third Report and Order specifically provides for at least one educational access channel in franchises issued after March, 1972 in systems with over 3500 subscribers. Systems existing prior to this date must provide an educational access channel by March. 1977. These channels must be free for five years after the completion of the main trunk line. After this time arrangements for the continuance of services will be made with the FCC and all affected parties. The key words in this provision are "at least" indicating the possibility of more than one channel. A second interesting phrase is qualified "local educational authorities."[20] The establishment of an educational consortium composed of public school and university administrators to fulfill this requirement will be discussed in a later section. Returning to the possibility of obtaining more than one channel, if a need can be demonstrated, additional channels may

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be provided for educational use. A second selling point may be in the attraction of new subscribers specifically for instruction programs for college credit. Certainly the response to Sunrise Semester in Chicago and similar programs in Maryland and New York would support these claims.[21] However, regardless of the of the ability or inability to show a need for access, a closed CTV system with interactive capabilities could still be built just for the university, but might be prohibitively expensive. Negotiating for these services will be discussed in the last section Prior to the actual planning phase, though, decisions must be made as to whether cable television is:(1) essential and (2) most efficient.[22] To facilitate this decision, specific applications of television. cable television, and related technological innovations will be discussed.

Applications of Telecommunications Technology

Some universities across the country have attempted to adopt a form of telecommunication technology to help solve some of the previously discussed problems. These projects range from a simple televised presentation of psychology courses at the University of Akron to an interactive cable system at Brigham Young University. In the following section some of the applications of: (1) television, (2) access. and (3) cable television systems currently in operation will be presented.

Televised Systems (CCTV)

The contributions of television in education have been minimal as previously indicated. However, several attempts to test its efficacy as an instructional strategy have found it to be successful in teaching cognitive skills, which are fairly low on Gagne's hierarchy.[23] Conversely, little success has been found with teaching complex and interactive skills via television techniques. Much of this research has utilized televised methods as presentations of lectures. In a review

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of this research literature, Schramm concluded that televised instruction was at least as effective as most instructional strategies and significantly better than others.[24] Research conducted since Schramm's review support his conclusions.[25] However, when the attitudes of students were considered. television techniques were not as successful because the new medium was only used to perform lecture-type tasks.[26] As a result, educators have concluded that this research has found that students can learn from television, but not more than can be learned from other instructional strategies.[27] However, since college enrollments have generally continued to rise, many universities have turned to television to reach mass enrollment type courses. This research has some implications for the use of cable television in the classroom. Principally, if televised techniques have been successful enough for the application to the increasing enrollment problem, the application of cable television should only improve the situation. The possibility of interactive techniques available via cable television should render CTV useful in areas where just television has failed, namely in interactive and psychomotor skills. The ability of the instructor to converse with the student should generalize the application of cable technology.

Many examples of televised mass enrollment courses at various institutions could be listed. However, very few of these uses of television could be classified as innovative. Two exceptions at the University of Akron and Nebraska are worth noting. At both schools, where pyschology and biology are respectively taught via television, both students and faculty seem to prefer it as a method of coping with large numbers of students. The availability of tutorial sessions have attracted students and the faculty are free from multiple sections of the same course. At Nebraska, the addition of computer constructed exams have allowed some control for individual differences and has decreased the failure rate with costs similar to those of conventional lecture methods.[27]

Television has also been applied to other situations besides mass enrollment

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classes. Beymer describes a videotaping technique of counseling sessions to improve technique, analysis, and the treatment of patients.[29] Similar methods have been used to record student-teacher interactions for retarded students. This procedure has resulted in improved interactions and occasionally even student behavior.[30] A last application is a technique developed by Genensky to use a television camera to manipulate the brightness and contrast of pictures of books to assist the legally blind to read and write.[31]

Past applications of television in education are somewhat important when considering the utilization of a CTV system. Obviously, innovations possible through televised techniques would be amenable to CTV as both utilize commercially available receivers. Consider the extension of telecommunication technology in the above examples. In both Nebraska and Akron, a university CTV system would allow some distinct advantages: (1) dormitory and apartment viewing to reduce needed classroom space and parking facilities. (2) program schedule flexibility (3) individual playback periods scheduled at the students' convenience possibly in carrels at a library or learning/living centers for slower students. and (4) community viewing possible for college credit to increase income for the university.

The application of CTV to the counseling. teaching retarded children, and picture manipulations for the blind can be easily envisioned. First, a counseling or retarded classroom session could be recorded then played back to fit the evaluators schedule. Also, the establishment of a tape library would permit the viewing of succeeding tapes to measure improvement over time. Second, Genensky's technique could be easily adapted to CTV. A tape library of required readings could be stored at the headend or the library. When a student desired a specific reading the appropriate code could be dialed to the computer and the daily assignment could be read in a dormitory viewing room.

The above discussion of CCTV adaptations to CTV is by no means inclusive.

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Its function has been to provide some logical extensions of existing distribution systems to the implimentation of CTV to answer questions of necessity. The application of such a system at a university would probably include existing equipment and fulfill the goals of these systems. Many colleges and universities have more sophisticated innovations that would be more amenable to CTV.

Extensions of Television Technology

Extensions of telecommunication technology range from the recording of psychomotor activities for analysis to dial access systems At Long Beach State, performances of dance to speech classes are recorded and later used for evaluations.[32] A similar technique is described by Coltman in theatre appreciation courses where recorded examples are played back for students.[33]

More sophisticated examples of the application of telecommunication technology is the TAGER system at Southern Methodist University. Engineers and students in the Dallas-Ft. Worth area attend classes in remote classrooms located in their plants or schools. All lectures are live and are connected by a two way audio system. All assignments are picked up by a currier and graded by the instructor. Similar systems also are in operation in Oklahoma and California. Since these systems utilize a microwave distribution system, they are fairly expensive. However, when compared to the cost of graduate education and in-service training, they have been found to be relatively efficient.[34]

Many dial access systems are currently in use at many major universities. Senour describes one system where audio programs are transmitted to learning carrels in twelve buildings providing three categories of instruction: (1) tutorial, (2) supplementary, and (3) review and reinforcement. Students can individually control the tapes and slide presentations. Audio cassettes have made this system relatively inexpensive.[35] A video dial access system is currently in use at Fullerton Junior Coolege in California Each student either views a scheduled lesson or participates in a random access situation on a limited basis Again the

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student can control the presentation.[36]

Another distribution system currently in operation at Oregon State University is very similar to CTV The School of Education uses the television studio to record micro teaching exercises Videotapes are played back later for evaluations. The system also allows the transmission of course review material to residence hall viewing rooms and over four thousand homes and apartments.[37]

The extensions of television technology suggest possible CTV adaptations and one example where a CTV distribution system would not be feasible. The application of television and the recording of psychomotor skills for later evaluation is adaptable to CTV. The performances could be recorded by cameras connected to a two way CTV system and activated by a simple digital device at the down stream terminal. Similar access equipment could later be activated in the instructor's office for the evaluation of these tapes.

The adoption of CTV in dial access systems should be less expensive than in conversions from simple one way CCTV. For example, the addition of CTV to the Fullerton Junior College system would add the necessary flexibility in the form of increased accessability to compensate for rising enrollments and increased use. The only added cost would be the cable and possible a headend (in a hub system) equipment. The terminals could probably be modified to the CTV system. In many cases, this cost would be negotiable.

Despite the wide spectrum of uses of CTV to higher education, it is not the most feasible in all instances. For example, a single CTV system would not satisfy the needs of systems like TAGER because they cover more than a five mile radius.[38] However, microwave transmissions could be fed into local CTV systems at the various universities and industries. The additional benefits, when compared to cost efficiency, may not warrant such a modification.

The preceeding two sections have dealt with possible adaptations of CCTV and ITFS systems to cable television, which may be beneficial to those administrators

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planning such a modification. For those universities which do not have a distribution system in operation and desire to implement one, the following discussion of existing CTV systems may be beneficial.

Cable Television in Higher Education

A recent National Cable Television Association survey found that sixty percent of the communities with CTV also had a college or university. One third of these institutions were connected to the CTV systems. Most of the schools utilizing cable television were either already using instructional television or the operator showed them how to operate CCTV equipment. The results of this survey also indicated that trading free programming for services was the primary relationship between commercial CTV systems and educational institutions.[39] The projects at universities which have appeared in the literature also seem to be just providing programs for the cable system which at least indicates the feasibility of a program/service tradeoff. These programs range from information concerning upcomming school bond issues at the Calffornia College of the Desert and campus activities at the University of Virginia and the University of Oregon to credit courses at Pepperdine University and San Diego State College.[40] These programs have served two functions. First, they offer crucial production experience to broadcasting students. Second, they function to meet one important goal of a university--to serve the local community

Educational institutions are also making other uses of cable television. The University of Kansas and the Overland Park cable system have installed a two way system to enable nurses and doctors to communicate to each other. The Lake Charles. La. system has installed a two way link between McNeese State College and the local high schools to facilitate the evaluation of student teachers. Cable television systems have also been a source for internship programs at Spring Hill College, University of Nebraska. and others.[41]

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These applications of cable television are important, but will never revolutionize education or begin to solve the problems inherent within the current educational philosophy. Two contrary examples to this rule are currently in operation at Oregon State University and the University of Kansas. The latter institution utilizes cable technology to solve the problem of a shortage of qualified junior college engineering instructors by cablecasting courses to these institutions. As a result, engineering students transferring to the university are now at equal performance levels as their state counterparts. Oregon State University turned to CTV when the local public television station discontinued the televising of courses when it joined the state network. By trading programming for service, the university was able to receive a free channel wired from the television station to residence halls and homes solving the space problem. Benefits accrued from this system have been: (1) the faculty can produce videotapes for evaluation, (2) home viewing eases classroom space and scheduling problems, (3) programs have brought the university and the community together, (4) students have been able to review course material prior to final exams and participate in noncredit short courses, and (5) the FM band has been used for the language lab.[42]

A third example showing the feasibility of cable technology is found in St. Cloud. The St. Cloud Education Association operates its own VHF channel of the local CTV system cablecasting for twenty-four schools and 6800 homes. The success of this in-service training system and seminars has led to plans for an audio retrieval system between schools.[43]

The relative success of these projects has resulted in plans at other institutions. In a plan for cable television in Washington, D.C. a vocational education program utilizing the Mitre Corp. TICCIT system is projected. The use of frame stoppers will enable the cablecasting of over 180 talk-talk type lectures over a single channel. This system will allow the instructor to receive immediate feedback which will be synthesized by a computer at the headend. The TICCIT system is also

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projected for use at Brigham Young University. This plan will utilize computer assisted instruction which should reduce costs normally associated with CAI and improve education by reducing the amount of time required to achieve objectives via individual instruction. Benefits will also be afforded to high risk students through CAI techniques. The TICCIT system is also one tenth as expensive as its predecessors. The system will consist of a mini computer, VTR, TV monitor, and an electronic keyboard. A simple decoder box will enable one channel to service 128 interactive terminals. The development of inexpensive terminals could also allow home participation in these courses.[44]

Other systems are also available to increase utilization possibilities of CTV besides TICCIT. For example, Eduplex, Inc. has developed an individualized system with the financial assistance of Teleprompter Corp. This system utilizes cable technology for the signal delivery. A concept is presented visually and reinforced through one of twenty-two audio signals selected by the student. The system has been found to be more efficient than traditional approaches to the languages, arts, and math.[45]

The possibility of utilizing computers and interactive communications in systems like TICCIT and Eduplex opens new vistas and suggests many other applications of computers and CTV at reduced costs and increased benefits.

Computer Assisted Instruction. CAI has long been identified as an efficient (time only) method of tailoring instruction to the individual student. Other uses include attempts to solve the problems of providing enough information to a growing population to allow it to adapt to a rapidly changing environment.[46] However, widespread use of computers to realize these goals has been limited by the cost of the equipment. If costs could be reduced, the addition of CAI to cable television would begin to shift instructional strategies in the direction of the individualization trend discussed previously. Several attempts to realize this goal are currently in progress. One at the University of Nebraska has already been discussed. CAI has

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also been used in a CTV experiment in Overland Park, Kansas to provide interaction and monitoring of homebound students.[47] The University of Illinois also has an extensive computer-based instructional facility called Plato III. This system integrates a keyboard and television monitor terminal with a computer. The computer controls all audio visual equipment, answers questions, and continually evaluates student progress. The range of possible tasks also includes student experimentation necessary in the physical sciences. An evaluation of the system has found students attaining necessary performance levels in one half to one third the time previously required with positive attitudes. As a result, a third generation computerized system, Plato IV, is being developed and should further reduce costs.[48] A similar system is also in use at Pepperdine University. As the student completes tasks in the course, the computer administers test items and controls progress through the course.[49] Benefits inherent in CAI which could also be realized by CTV include increasing: (1) students receiving preferential treatment, (2) instructional alternatives, (3) the amount of cummulative data for evaluation, and (4) possible instructional objectives.[50] The use of computers will also produce benefits for information retrieval systems.

Information Retrieval Systems. The combination of computer-based techniques and interactive communication can tailor information retrieval tasks to individuals. For example, different search techniques could be programmed for researchres of varying knowledge levels. Conversely, information on users can be tabulated to continually update source material. An information bank could also function to maintain statistics on the business world and fields of most need. Listfax, a system capable of providing these services was demonstrated at a recent DAVI convention.[51] The extension of similar systems to CTV would transform libraries from information repositories to dispensaries. Several libraries already have some of these capabilities. Utilizing a call-in procedure, the public library in Mobile, Alabama cablecasts bibliographies. maps, etc. on demand. A public

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library in Casper, Wyoming has a similar system which provides a reference service. Another library in Port Washington, Long Island lends video equipment to patrons and offers instructions for useage. Services like these might eventually make libraries ideal locations for public access programming and videotape storage. Many libraries, espécally in universities, already possess video and audio playback equipment.[52]

Another information retrieval system utilizing CTV technology would be the media center. Brevard Junior College currently operates a Uniterm system to locate available resources.[53] By connecting this system and those used in libraries to CTV, a researcher could require specific information or a literature search via a digital terminal. A system utilizing key words could locate all relevant materials and reduce the time currently needed in the preliminary phases of research. With the addition of a print out terminal, these sources could be cablecasted to the requestor. However, such technological advances are probably not practical when cost is weighed against resource savings.

The preceeding section has attempted to provide some possible applications of cable technology to institutions of higher learning. However, just to discuss possible and existing experimental innovations would not, in itself, be beneficial to an educator attempting to determine the feasibility of adopting a CTV distribution system. Before such decisions are made, the probable benefits must be carefully considered. These benefits are discussed in the following section.

Benefits of Cable Television

If the adoption of CTV is to realize any needed tangible benefits, it must begin to solve the problems currently inherent in higher education, meet the changing trends in instructional strategies, and satisfy the traditional goals of a university. The problems involve increasing enrollments with decreasing resources which have

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resulted in mass enrollment courses. Operating against the need for large courses is the change in emphasis from mass to individualized instruction. The problem, then is to provide individualized techniques to growing numbers of students at less cost than required under traditional methods. Obviously, the change dictated by this problem lies in the distribution system. Somehow, instructors must be able to reach an infinite number of individual students. Cable television offers this benefit. Basically, the contributions available from the adoption of CTV can be categorized as: (1) providing previously unavailable services, (2) increasing physical access (3) improving the quality of education, and (4) decreasing the unit cost.

Unaccessable Services

Services not possible in traditional approaches to education are those which are limited by class size and the inexperience of the students. Through videotape the presentation of hazardous skills become possible, e.g., fire fighting techniques. Students could also visit previously unaccessable places, e.g., a foriegn country. The introduction of master teachers and resource people would be possible through interconnected CTV systems. Also, the use of innovative production techniques would make this type of presentation more interesting.[55] These services, plus the schedule flexibility of a multi-channel CTV system would be available to more people as physical access increases.[56]

Physical Access

For the distribution system to be successful it must be capable of reaching more individual students than traditional methods. By placing terminals in living/learning centers, libraries, and individual apartments and homes would enable any given instructor to reach not only enrolled students, but other students and community members if desired. Many benefits can be accrued from placing terminals in residence halls. First, a major headache at most universities. parking and

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transpcrtation, should be effectively reduced. Second, the need for large classrooms would be diminished and existing rooms could be equipped with terminals Third, the need for printed communications between administrators and students could be reduced by utilizing the CTV system. Fourth, the primary goal of a university, to serve the community, could also be attained through information and cultural cablecasting This benefit would also integrate commuters in college life. The addition of interactive cable should increase both community and commuter involvement in campus affairs. In-service training for teachers and other professionals would be another benefit accrued from CTV. The success of the TAGER system has shown the feasibility of such a service. A seventh benefit would be the possibility of adding specialized courses which normally are very expensive at reduced cost. A CTV distribution system would enable these courses to be made available to more people, as well. Also, supplementary enrichment courses could be implemented to assist slower students and allow the further advancement of gifted and graduate students.[57]

A last example of the benefits possible in the utilization of a CTV system relates to a recent recommendation of the Carnegie Commission suggesting the establishment of fifty four year and five hundred community colleges in major metropolitan areas to improve the equality of education for the poor and the minorities.[58] The establishment of a video (CTV) university in these areas by existing institutions could meet this demand with all the benefits of individualized instruction at less cost.[58] The success of similar over-the-air offerings in Chicago, New York, and Los Angeles suggests the feasibility of this approach.[60]

So far, the benefits possible in a CTV distribution system have been accrued in previously unaccessable services and physical access to education. These benefits will not be significant if the quality of education is not also improved.

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Quality of Education

Empirical research has concluded that television is at least as efficient as other traditional instructional strategies in the areas of cognitive skills. However, much of this research has used television as an extension of existing methods rather than as an integral part of instruction. If televised techniques are combined with CAI, benefits of both techniques should be realized. Such was the case in the Plato system and the multimedia techniques at St. Mary's.[61] Hopefully, the projects at the University of Nebraska and Oregon State University will support these findings. If true, the adoption of CTV in higher education would seem to be the only logical solution to the problems of improving education, especially when interactive techniques at low cost become available. The addition of two way cable can provide the necessary student participation and permit individualized instruction.

Other improvements in education are also possible through a CTV distribution system. First, many mass enrollment introduction courses are taught by graduate students and even faculty wives.[62] The addition of CTV would allow master instructors to prepare interesting courses for multiple classes and still be allowed to pursue specialized interests. The lending of instructional packages or interconnection via satellite or microwave would also enable students to have access to exceptional instructors at other institutions. Second, student attitudes should be enhanced by innovative production techniques and the possibility of producing their own programs for access channels. Such was the case at Fullerton Junior College.[63] Interactive techniques also enhanced student attitudes in a study conducted by Vento.[64]

Consequently, the adoption of CTV in a university would allow students to receive more services and better education. Now if these benefits can be realized at less cost than traditional methods, then educators would have few reasons not to adopt CTV.

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Unit Cost

One factor which has successfully inhibited the use of innovative media techniques has been cost. The cost of prints and playback equipment has made the widespread showing of films not feasible. CAI has long been known to be an efficient method of instruction, but the cost of terminals and computers has limited its application. The same cost factor has precluded many utilizations of CCTV and ITFS as universities have had to pay for entire systems. CTV differs from these distribution systems in that the community will share in expenses through subscriptions. Also, CTV systems are generally less expensive than both CCTV and ITFS if only the production facilities are considered.[65] For, in CTV a university can share this equipment with the local CTV franchisee. The cost of installing the cable is negotiable in many cases.

Current projects, at Oregon State University, have found amplifiers and computers to be the most expensive with terminals (including cameras) costing about $300.00. However; the OSU experience has been that CTV does save money. Similar results are expected at the University of Nebraska. The TICCIT system is projected to be less expensive than its predecessors. Savings will occur in the needs of the physical plant and space, also. Additional revenue will be realized on external courses offered to the community.[66] In sum, then, savings should occur in per student hour costs and additional revenue should be attracted through the ability to serve more students and the capability of offering courses to the community.

Basically, four tangible benefits which can begin to solve the problems in education, meet changing trends, and satisfy traditional goals can be realized from a CTV distribution system. However, once the decision is made to adopt CTV, extensive planning must be implemented to make futuristic benefits a reality.

Planning for Cable Television

Definitely the most important and crucial phase of adopting a CTV distribution

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system is planning. Without proper planning CTV as an instructional innovation will suffer the same maladies associated with television. Despite the record of television in education, many experts feel that CTV has an important role in education mainly because of its abundance of channels enhancing both school and community viewing.[67] However, these benefits and those discussed in the preceding section will not be realized unless thorough planning is based on a comprehensive study of the needs of respective educational institutions. This section will deal briefly with some of the issues which must be considered when planning for a CTV system.

Preliminary Considerations

The first step in deciding to adopt a CTV system is the identification of the problems. A review of the preceeding section on this topic should facilitate this task. Second, the existing distribution system must be evaluated to determine if it has the capability of solving the previously identified problems. If this system can not both solve these problems and provide the benefits discussed earlier, then CTV may be desired. Once this desirability is established, a careful research plan must be implemented. Important questions which must be answered (phase I) center around these issues: (1) teacher and student attitudes, (2) identification of the target audience, (3) establishment of the general goals (probably based on the four benefits), (4) impact on the educational philosophy, (5) applicability of television to desired subjects based on instructional objectives, (6) impact on the community, (7) identification of primary resources, (8) usage by various departments, and (9) preliminary franchising needs. When phase I is completed and the results support the desirability for CTV then phase II can be implemented. Tasks involved in this phase include: (1) committments from program sources, (2) financial assistance (HEW Title VI, NSF, USOE, etc.), (3) preliminary arrangements with the cable operator, (4) establishment of precise goals, (5) exact equipment list, (6) formulation of preliminary program outlines by program sources and various departments, and (8) synthesis of

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the project (including the budget, location of equipment, program schedule, and project utilization). Probably the most important consideration of phase II is the specification of the project goals. These goals should be simple and concise for they will guide the planners in all decisions. When phase II is completed the organization for the project should be assembled. Members should typically include: administrators, program development personnel including both production and instructional development consultants, budget personnel, and an evaluation component to assess the effectiveness of the programs. Other members may also be comprised of the public school officials forming an educational consortium for the best planning for the entire franchise as suggested by the AECT.[68] Once the preliminary decisions have been made, then negotiations with the cable operator should be conducted.[69]

Franchise Negotiations

Negotiations with the cable operator can take many forms. First, the system for the local community may not have been awarded. In this case, a meeting with the franchising authority to include educational provisions for the consortium should be conducted. Such provisions must be practical and based on actual needs specified in the plan. Periods of renegotiation can be included in the local franchise for future expansion of services. Second, the local community may not have a CTV system planned for the near future. One alternative which has met with some success at Vincennes University would be for the university to franchise systems in surrounding communities.[70] Profits from these systems could be used to finance later expansion needs. However, special care and additional planning are needed if this task is to be undertaken. Original resources must then be budgeted for the necessary technicians normally employed by the cable operator. Many organizations, e.g., Publicable, have been established which could be of service in such instances. Third, and most likely, a CTV system may already be in operation. If this is the

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case, an entirely different strategy must be implemented. Three issues must be remembered in all negotiations with cable operators. First, these people are basically speculative and will probably be impressed with a cogent plan for program orgination. The more practical the better. Practicality, in this case, is defined by the ability of the cablecasted programs to attract subscribers. A community ascertainment study and the data accumulated from past over-the-air college credit courses would be important. The second issue, as discussed in the Sloan report, is that CTV is most economically feasible when the capacity of the system is used to attract large numbers of people at a moderate cost.[71] Properly phrased, educational services can be couched in terms of utilizing available channels to increase services thereby increasing subscribers. The third issue involves the phraseology used when negotiating for channel space. Cable operators, especially multiple system owners, expect educators to demand exorbitant services which will never be utilized. If services are requested and supported with practical plans, the cable operator should be more willing to be reasonable. The availability of pilot programs would show industry representatives that the consortium has the skill to successfully implement a plan. These negotiations should also focus on benefits accrued by both the school and the CTV operator.[72] One particular benefit for the CTV operator would be a program source when the system will be required to originate programming in March, 1977. This arguement was successful for the State University of New Palz in New York.[73] Other universities have been equally as successful, but in varying degrees. Provisions have ranged from regular fees to minimum fees of $1.25. Some systems have shared in equipment expense while others have arrangements to use school public television stations in exchange for services.[74] Some universities exchange programs for services as discussed earlier. Many alternatives are possible and can be dictated by the ability to establish a positive relationship with the cable operator. Once these provisions have been established, the formidable task

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of constructing programs for actual use must be confronted.

Program Construction

Previous attempts to integrate television into the classroom has involved merely televising lectures. These precedures can only be successful in attracting students and CTV subscribers if the lecturer possesses unusual skills. Programs produced for cable television, to date, seem to be suffering from the same short-sightedness. The result has been that administrators have not been evaluating the complete cable technology as most of the effort is being expended in the development of hardware at the expense of software. Educators must be at least as concerned with the careful planning of programs as well as the development of the equipment.[75] However, before any programs are actually constructed, the specific goals of the project and instructional objectives of the course must be utilized in very rigorous planning. This is where the instructional development and continuing education consultants will make their most important contributions in conjuction with the production staff. These programs must both entertain and instruct[76] for they must overcome the traditional concept of the passive viewing commonly associated with commercial television. The success of Sesame Street has shown that active television can be successful. Some techniques used in televised college courses, however, have met with little success. Both Carpenter and Craig discuss attempts to bring the television camera into the classroom to capture interaction between students and instructors. This technique has only functioned to alienate the viewing student.[77] A second problem with this approach is its failure to cope with the problem of individual needs of the students. This is where the evaluation staff will be important--to determine if the programs do meet the individual needs and goals. To meet these needs and goals, programs will probably have to be locally produced as few commercially available programs offer evaluative data. Issues to be considered when evaluating programs are: (1) do they meet instructional and project objectives,

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(2) do they modify teacher resistance to change by integrating the instructor into the planning procedure, and (3) do they produce positive student attitudes. All three of these criteria must be met if the programs are to be successful.

Conclusion

A survey conducted by the NCTA has found that cable television is not now being utilized for "hard" instruction to provide some impetus for wholesale changes needed to improve education, lower costs, meet individual needs, and compensate for rising enrollments. Consequently, since CTV is being used merely as an extension of what exists, similar to the fate of television, it has become an added cost rather than a method of reducing expenses. About the only exception has been the offering of college credit courses. Many educators are calling for action now, while CTV is just in the development stages. Without quick action, CTV will be just another frill unless comprehensive planning and action are accomplished.[79] Naturally, such changes will take time. Programs must be developed and empirically tested; and, in some cases, the FCC must act to support educational provisions. However, such action will not be taken if educators in the colleges do not assume leadership. It is our responsibility to improve the quality of education and, at the same time, satisfy community responsibilities and trends in education. Cable television seems to be the only answer to this dilemma.

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